Thallium Encyclopedia Article

Thallium

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Thallium

Thallium is the last element in Group 13 of the **periodic table**, a group of elements sometimes known as the **aluminum** family. Its **atomic number** is 81, its atomic **mass** is 204.37, and its chemical symbol is Tl.

Properties

Thallium is a heavy, bluish white metal that resembles **lead** (atomic number 82) in its physical properties. It is very soft and melts easily. Its melting point is 576°F (302°C), its **boiling point** is 2,655°F (1,457°C), and its **density** is 11.85 grams per cubic centimeter. Thallium is a fairly reactive element that combines with **oxygen** in the air to form a coating of thallium **oxide** (Tl_2O).

Occurrence and Extraction

Thallium is a rather uncommon element with an abundance of about 0.7 parts per million in the Earth's crust. Its most common minerals are crookesite, lorandite, and hutchinsonite. The element is usually obtained as a byproduct of the recovery of lead and **zinc** from their ores.

Discovery and Naming

Thallium was one of four elements first discovered by spectroscopic analysis. British physicist Sir **William Crookes** first observed the distinctive green spectral lines of the element in 1862. He suggested the name thallium for the element after the Greek word *thallos*, meaning "budding twig." The element was discovered almost simultaneously through traditional chemical analysis by the French chemist Claude-Auguste Lamy (1820-1878).

Uses

Thallium is too rare and too expensive to have many practical uses. For many years, one of its compounds, thallium **sulfate** (Tl_2SO_4) was used as a rodenticide. Unfortunately, the mechanism by which it causes death in rats is also operative in humans. The danger to humans, especially children, posed by thallium sulfate became great enough for the compound to be banned for that purpose. Small amounts of the element are now used to make thallium sulfide (Tl_2S) for use in specialized kinds of photocells. The element has also been used experimentally to produce superconducting materials.